REMARKS

I. Status of the Application

Claims 37-48 are pending in the present application. Applicants gratefully acknowledge the allowance of claims 39-48. Applicants' priority claim to provisional application 60/128,402 through parent application 09/545,207 stands denied because the Examiner asserts that the '402 application fails to provide support for the present claims under 35 U.S.C. § 112. Claims 37 and 38 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Ayers (US 5,801,092) (hereinafter "Ayers '092") and also by Wicks et al. (US 5,637,507) (hereinafter "Wicks"). Claims 37 and 38 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Ayers (US 6,277,766) (hereinafter "Ayers '766).

Applicants have amended the claims in order to more clearly define and distinctly characterize Applicants' novel invention. Claims 37 and 38 have been amended to specify that the claimed porous substrate has a very high surface area for synthesis of high density polymer arrays, and that the claimed porous substrate provides an increased surface area adapted for polymer attachment. Support for these amendments can be found throughout the specification as filed, for example at page 1, lines 17-18 and page 1, line 29 to page 2, line 2. Claim 37 has also been amended to incorporate the step of removing the carrier, which is present in pending method claim 38.

Applicants respectfully request entry of the foregoing amendments and reconsideration of the rejected claims in view of the following remarks, which are intended to place the entire application in condition for allowance.

II. Provisional application 60/128,402 does provide support under 35 U.S.C. 112

At page 2, paragraph 1 of the instant Office Action, the Examiner has denied Applicants' priority claim to Provisional Application 60/128,402 on the grounds that the '402 application does not provide adequate support under 35 U.S.C. § 112 for the claim element "an unsintered porous layer." Applicants respectfully traverse.

The '402 application does provide support for an unsintered porous layer. At page 2, lines 3-14, the '402 application discloses a sol-gel method for preparing porous glasses from inorganic oxides, in particular silicon oxides. "The resultant porous glass structure *optionally* can be sintered at elevated temperatures." (Page 2, lines 9-11; emphasis added.) Thus, the disclosed "resultant porous glass structure" is an unsintered final product, but can be sintered as an optional additional step. At pages 78-86, the '402 application discloses a specific example of a sol-gel method for depositing silica onto a substrate to form a porous layer, with final steps of drying at ambient and elevated temperatures and then mildly sintering at a higher temperature (page 80, lines 3-7). One of ordinary skill in the art reading the disclosure of the '402 application as a whole would understand from the teaching of page 2, lines 3-14 that mildly sintering the porous layer is an optional final step performed in the specific example, but not required in all instances.

For at least the above reasons, the '402 application does provide 35 U.S.C. § 112 support for an unsintered porous layer, that is, the porous layer of pages 78-86 without the optional final step of sintering. Accordingly, Applicants respectfully request for the present application an effective filing date of April 8, 1999 based on a valid priority claim to the '402 application.

III. Claims 37 and 38 are novel over Ayers '092

At page 2, paragraph 3 of the instant Office Action, claims 37 and 38 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Ayers '092. The Examiner is of the opinion that Ayers '092 teaches each and every claim limitation. Applicants respectfully traverse the rejection based on the amended claims. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Amended claims 37 and 38 are directed to methods of forming a very high surface area porous substrate for synthesis of high density polymer arrays, such that the porous substrate provides an increased surface area adapted for polymer attachment. In contrast, Ayers '092 is directed to a process for making an electrically insulating layer for use on microelectronic devices (abstract), specifically to methods for depositing two-component nanospheres on semiconductor wafers (col. 2, lines 61-63). Ayers '092 does not teach or suggest synthesizing a polymer array on the disclosed nanosphere-coated semiconductor wafer, or that the nanosphere layer is adapted for the attachment of polymers.

On the contrary, the nanosphere-coated semiconductor wafer of Ayers '092 is not useful for attachment of polymers. Ayers '092 teaches that the two-component nanospheres consist of spheres of silicon dioxide with a covalently attached coating of fluorocarbon chains (col. 5, line 24 to col. 6, line 25). When deposited onto a semiconductor wafer, these non-polar fluorocarbon-coated nanospheres provide low dielectric constant, low moisture uptake, high thermal stability, and high chemical resistance (col. 5, lines 13-20). In other words, the fluorocarbon-coated nanospheres provide a Teflon-like layer when deposited on the substrate. It

is well known in the art that Teflon is a material made from fluorocarbon chains (polytetrafluoroethylene), having all the properties listed by Ayers '092 for its nanosphere layer (see above), and also being both oleophobic (resistant to oil) and hydrophobic, therefore not allowing most substances to adhere (non-stick) (http://www.lenntech.com/teflon.htm). Applicants submit that the fluorocarbon-coated nanosphere layer of Ayers '092 inherently possesses the same properties as Teflon, and thus is not adapted for polymer attachment, nor for synthesis of high density polymer arrays, as claimed. Because the fluorocarbon-coated nanospheres are non-sticky and highly chemical resistant, polymers cannot be non-covalently or covalently attached to a layer of these nanospheres desposited on a substrate as taught in Ayers '092.

For at least the above reasons, Ayers '092 fails to teach each and every limitation of claims 37 and 38, and so fails to anticipate the subject claims. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 102(b) rejection and allowance of claims 37 and 38.

IV. Claims 37 and 38 are novel over Ayers '766

At page 3, paragraph 4 of the instant Office Action, claims 37 and 38 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Ayers '766. The Examiner is of the opinion that Ayers '766 teaches each and every claim limitation, and that Ayers '766 is 102(e) prior art for reasons discussed above in section II. Applicants respectfully traverse the rejection based on the amended claims.

For reasons discussed in section II above, the present application has an effective filing date of April 8, 1999. Ayers '766 has a 102(e) date of February 3, 2000, so it is not prior art with

regards to the present application. But even assuming that Ayers '766 was valid prior art, the reference still fails to anticipate the subject claims. Amended claims 37 and 38 are directed to methods of forming a very high surface area porous substrate for synthesis of high density polymer arrays, such that the porous substrate provides an increased surface area adapted for polymer attachment. In contrast, Ayers '766 is directed to a process for making an electrically insulating layer for use on microelectronic devices (abstract), specifically methods for depositing fullerene-decorated inorganic nanoparticles on semiconductor wafers (col. 3, lines 19-21). Ayers '766 does not teach or suggest synthesizing a polymer array on the disclosed insulated semiconductor wafer, or that the insulating layer is adapted for the attachment of polymers

The Examiner asserts that Ayers '766 teaches at col. 6, line 49 colloidal silica having a particle size of about 12 nm, the lower end of the claimed range of about 12-100 nm. Ayers '766 actually discloses silica particles with diameters of 6 nm (col. 6, lines 48-66) and 6-7 nm (col. 8, lines 55-56). Nowhere does Ayers '766 disclose a particle size within the range of 12-100 nm. The Examiner asserts that "about 12-100 nm" includes a range of 6-7 nm. However, a range of 6-7 nm does not overlap with a range of 12-100 nm. Even if 6-7 nm were to slightly overlap with about 12-100 nm, the Federal Circuit has ruled that: "although there is a slight overlap [0.1–5.0 % as claimed versus 0.001–1.0 % in prior art], no reasonable fact finder could determine that this overlap describes the entire claimed range with sufficient specificity to anticipate this limitation of the claim. The ranges are different, not the same." *Atofina v. Great Lakes Chemical Corp.*, 78 USPQ2d 1417, 1424 (Fed. Cir. 2006). Similarly, the Ayers '766 teaching of 6-7 nm particle size does not anticipate the claimed range of about 12-100 nm.

For at least the above reasons, Ayers '766 is not valid prior art, and also fails to teach each and every limitation of claims 37 and 38, and so fails to anticipate the subject claims.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 102(e) rejection and allowance of claims 37 and 38.

V. Claims 37 and 38 are novel over Wicks

At page 4, paragraph 5 of the instant Office Action, claims 37 and 38 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Wicks. The Examiner is of the opinion that Wicks teaches each and every claim limitation. Applicants respectfully traverse the rejection.

The Examiner asserts that Wicks teaches the claimed colloidal silica particle size at col. 5, lines 4-6. On the contrary, the particle size disclosed by Wicks is not for colloidal silica used to make the disclosed glass matrix, but for an additive to the glass matrix that can be metal particles such as alumina (col. 4, line 20 to col. 5, line 10). Wicks is silent on the particle size of the disclosed glass matrix made by a sol-gel process using tetraethyl orthosilicate as a starting material (col. 4, lines 20-32, Fig. 1). Therefore, Wicks fails to teach the claimed colloidal silica particle size of about 12-100 nm.

The Examiner relies upon Fig. 1 of Wicks, showing films made of two layers of particles, to anticipate the claimed porous layer thickness. Since Wicks does not disclose the size of the particles in the sol-gel mixes and on the films, the skilled artisan cannot infer any numerical thickness for the films shown in Fig. 1. Therefore, Wicks fails to teach the claimed porous layer thickness of about 0.1-1 micron.

The Examiner asserts that the claimed porosity of "about 10-90%" encompasses a porosity of 0-100%. This asserted range cannot be read into the claims because the claimed "porous substrate" cannot be 0% porous (all substrate and no pores), and it cannot be 100% porous (all pore and no substrate). Wicks fails to disclose a specific amount or numerical range

for the porosity of his glass matrix. So the skilled artisan cannot determine from Wicks' disclosure whether the porosity of his glass matrix falls within the claimed range. Therefore, Wicks fails to teach the claimed porosity of about 10-90%.

The Examiner asserts that Wicks teaches at col. 8, lines 38-46 the method of claim 38 wherein colloidal silica is spun onto a substrate. On the contrary, Wicks only discloses that a composition may be spread onto a substrate, but does not teach the step of spinning. "Spreading" does not inherently, specifically teach "spinning" because there are many other methods of spreading, for example by using a tool such as a spatula. Therefore, Wicks fails to teach the step of spinning the substrate material and the applied solution to achieve a spun layer on the substrate material as recited in claim 38.

For at least the above reasons, Wicks fails to teach each and every limitation of claims 37 and 38, and so fails to anticipate the subject claims. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 102(b) rejection and allowance of claims 37 and 38.

VI. Conclusion

Having addressed all outstanding issues, Applicants respectfully request reconsideration and allowance of the case. To the extent the Examiner believes that it would facilitate allowance of the case, the Examiner is requested to telephone the undersigned at the number below.

Respectfully submitted,

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